rium, and were the subject of some very interesting notes on their habits, prepared by Miss Agnes Crane, and published in the Zoological Society's Proceedings, from which the following particulars are extracted :—

"Lettuces and endives formed the favourite food of this pair of Manatees ; six dozen of these vegetables, weighing 30 pounds, being their average daily allowance. The male would devour at a pinch leaves of the cabbage, turnip, and carrot. Both relished those of the dandelion and the sow-thistle (*Sonchus oleraceus*). Some varieties of a common river-weed were also taken ; but this food was abandoned on account of the leeches with which it was found to be infested Sometimes the animals swim gently about, and pursue the leaves floating on the water. At others, the plants are seized in their mouths, drawn down, and eaten under water, the hand-like fore-fins being employed in separating the leaves The food is invariably swallowed below the surface. The masticatory actions of the animal have been so fully and accurately described by Prof. A. H. Garrod, F.R.S. (Trans. Zool. Soc., vol. x. p. 137), that further remark on that subject is unnecessary. The habits of the animals in captivity, while affording occasional evidence of the ease and rapidity with which they move in the water, do not furnish much support to the views of their capability of habitual active progression on land. Yet it must be admitted that, supplied with a sufficiency of nicely-varied food, they have no inducement to leave the water, and that the construction of their straight-walled tank precludes such efforts as a rule. The male, however, has recently been observed to make some slight attempts at terrestrial movement, turning himself round and progressing a few inches when his tank was empty. With jaws and tail-fin pressed closely to the ground, the body of the animal becomes arched, and is moved by a violent lateral effort, aided, and slightly supported, by the fore-paddles, which are stretched out in a line with the mouth. But the effect of these very laboured efforts was not commensurate with their violence ; in fact, their relation to active locomotion may be compared to those of a man lying prone with fettered feet and elbows tied to side. Nor does the Manatee seem at all at ease out of water, as he lies apparently oppressed with his own bulk, while he invariably makes off to the deepest corner of his tank directly the water is re-admitted. One point may be regarded as definitely settled. Notwithstanding the predilection they have evinced for land vegetables, they never feed out of water. Food has been repeatedly offered them, but it always remains untouched, although readily devoured when the influx of water set the leaves floating on the surface. Although it is possible that the animals can get out of water and remain so for a short period, as they progress so slowly and do not feed out of water it seems as though they must be acquitted of the garden depredations and prolonged wanderings from their native element with which they have been credited."

The Manatee now in the Zoological Society's Gardens has been placed in one of the large warm-water tanks in the Reptile House, the corresponding tank on the opposite side being occupied by a very fine specimen of the Snapping Turtle (*Macroclemmys temmincki*).

After inspecting the Manatee, those who wish for more information on the subject of the Sirenians should visit the Natural History Museum at South Kensington, and examine the splendid mounted skeleton of the *Rhytina*, or Steller's Sea-cow—a recently extinct gigantic representative of the same order of mammals—in the Palæontological Gallery.

THE ROYAL SOCIETY SELECTED CANDIDATES.

THE following fifteen candidates were selected on Thursday last by the Council of the Royal Society to be recommended for election into the Society. We print with the name of each candidate the statement of his qualifications :—

JOHN AITKEN.

He is an accurate, successful, and highly inventive investigator in Experimental Physics, and for the purpose of his investigations has designed and constructed many ingenious and valuable pieces of apparatus. Has carried out a valuable and instructive research regarding the relations between fog and dust in air, and in connection therewith has devised and used methods for counting the number of dust particles in air. The results of his works were given in numerous papers read by him before the Royal Society of Edinburgh, and published in the Proc. and Trans. Roy. Soc. Edin., during the years from 1875 until the present date. Received from the Roy. Soc. Edin. the Keith Prize for 1883–85, for a paper on "The Formation of Small Clear Spaces in Dusty Air" (1884), being a continuation of the subject of a former paper "On Dust, Fogs, and Clouds" (1880), and for contributions on atmospheric phenomena, the more important of these being a series of papers on "Thermometric Screens" (1884–87).

EDWARD BALLARD, M.D. (Lond.),

Physician in H.M. Civil Service. Eminently distinguished as an Investigator of Causes of Disease, and as a promoter of scientific sanitary administration. Has published, *inter alia*, as follows :—On the Influence of Weather and Season on the Public Health, based on the Statistical Study of 272,000 Cases of Sickness (1857–68) ; On Vaccination and its Alleged Dangers (1868) ; A Local Outbreak of Enteric Fever traced to a Local Distribution of Milk (1871) ; Reports to the Local Government Board, year by year, on particular inquiries, local, or more or less general (1871–88). Of the latter the following may be named :—The Effluvium Nuisances which arise in various manufacturing and other branches of industry, studied as to their Effects on the Public Health, and as to their Preventability (1876–78) ; various Studies of Outbreaks of Disease referable to Articles of Food (1873, 1880–88) ; Survey of England as to the Local Preparations against Chlorea (1885–86) ; Studies of the Causation of Epidemic Infantine Diarrhœa in England and Wales (1882–88).

ALFRED BARNARD BASSET, M.A.,

Barrister-at-Law. Author of a treatise on Hydrodynamics, in two volumes (1888) ; also papers in the *Quart. Journ. Math.*, *Mess. of Math.*, *Phil. Mag.*, Proc. Lond. Math. Soc., Proc. Camb. Phil. Soc., Phil. Trans. Roy. Soc. (1888), and *Amer. Journ. Math.* These papers treat of the Motion of Liquids about Elliptic Cylinders, of Associated Functions and Spherical Harmonics, of Electric Currents of a Sheet rotating in a Field of Magnetic Force, the Potential of a Spherical Bowl, Motion of a Liquid Ellipsoid and Stability of this Motion, Motion of two Spheres in a Liquid, Potentials of Circular Disks, Motion of a Ring in a Liquid, Motion of a Sphere in a Viscous Liquid, and the Steady Motion of an Annular Mass of Rotating Liquid.

HORACE T. BROWN,

F.C.S., F.I.C., F.G.S., Brewer. Distinguished as an investigator of the Carbohydrates, and of the Phenomena of Fermentation ; also on account of the services he has rendered in introducing scientific methods into the brewing industry. Author of the following and other papers :—"On the Estimation of Ammonia in Atmospheric Air" (Proc. Roy. Soc., 1870) ; "On the Influence of Pressure on Fermentation" (Journ. Chem. Soc., Part I., 1872, Part II., 1873) ; "On the Electrolysis of Sugar Solutions" (*ibid.*, 1872). In conjunction with Mr. Heron :—"Contributions to the History of Starch and its Transformations" (*ibid.*, 1879) ; "Some Observations on the Hydrolytic Ferments of the Pancreas and Small Intestine" (Proc. Roy. Soc., 1880). In conjunction with Dr. Morris :—"On the Non-crystallizable Products of the Action of Diastase upon Starch" (Journ. Chem. Soc., 1885) ; "Determination of the Molecular Weights of the Carbohydrates" (*ibid.*, 1888).

LATIMER CLARK,

C.E., F.R.A.S., F.R.G.S., Electrical Engineer. Past President of the Institution of Electrical Engineers. Author of :—"Description of the Britannia and Conway Tubular Bridges ;" chapter on "Tides of the Menai Straits," in E. Clark's book on the Britannia and Conway Bridges; "Elementary Treatise on Electrical Measurement;" and (jointly with R. Sabine) "Electrical Tables and Formulæ." Author of various papers on Electric Measurement, and on various branches of Engineering Science, published in Report of the Brit. Assoc., the Government Report on Submarine Cables, and the Engineering Journals. Introduced a standard voltaic cell of great importance and value for promoting accurate measurement of electric potentials, and presented a paper on this subject to the Royal Society, which was read June 19, 1873. From 1848-51 was Resident Assistant Engineer at the Britannia Tubular Bridge, under the late Robert Stephenson. In 1851 became Engineer to the Electric and International Telegraph Company, and remained in this service for 20 years, part of the time as Engineer-in-Chief. Made important observations on the passage of electricity through long underground lines, of which the results were the subject of Faraday's Bakerian Lecture of 1854, and are given in his "Experimental Researches," with Faraday's own experiments and theory. In 1854 introduced the system of transmitting messages through "pneumatic-despatch tubes" in the Electric Telegraph Company's service. The system is continued in the Postal Telegraph system of the Government, having been found admirably successful and useful.

DAVID DOUGLAS CUNNINGHAM, M.B, C.M. (Edin).

F.L.S., Surgeon-Major, Beng. Med. Service, Honorary Surgeon to the Viceroy of India. Professor of Physiology, Medical College, Calcutta. Fellow of the University of Calcutta. Distinguished as the author of numerous original scientific memoirs in connection with Animal and Vegetable Physiology and Pathology, among which may be noted:—"On certain Effects of Starvation on Vegetable and Animal Tissues;" "On the Development of certain Microscopic Organisms occurring in the Intestinal Canal;" "On the relation of Cholera to Schizomycete Organisms:" and (in conjunction with the late Dr. T. R. Lewis, F.R.S., elect.) of the following papers relating to the Etiology of Cholera and other Diseases:—"A Report of Microscopical and Physiological Researches into the Nature of the Agent or Agents producing Cholera;" "The Soil in its Relation to Disease;" "Cholera in Relation to certain Physical Phenomena;" "The Fungus Disease of India;" Leprosy in India;" &c., &c. Distinguished as an eminent Indian Physiologist and Pathologist.

LAZARUS FLETCHER, M.A. (Oxon),

F.G.S., F.C.S., Memb. Phys. Soc. President of the Mineralogical Society. Late Scholar of Balliol College, and Fellow of University College, Oxford. Late Millard Lecturer on Physics, Trinity College, and Junior Demonstrator at the Clarendon Laboratory at Oxford. Senior University Mathematical Scholar, 1876. Late Examiner in the Natural Science Schools in Oxford and Cambridge. Keeper of the Mineralogical Department, British Museum. Conducted the re-arrangement of the Minerals in the new Museum at South Kensington, and by his descriptions of these in the "Guides" published by the Trustees of the British Museum, has contributed valuable aid to the students of Crystallography and Mineralogy. Is the Author of many memoirs in the Journal of the Crystallological Society, and recently that of the Mineralogical Society (with which the former Journal has been united) on various minerals, including Copper, Silver, Gold, Bismuth, Sulphur, Nagyagite, Realgar, Zircon, Skutterudite, and Copper Pyrites, and of two important mathematical memoirs on the Dilatation of Crystals on Change of Temperature, in *Phil. Mag.* 1880 and 1885.

WILLIAM BOTTING HEMSLEY,

A.L.S. Assistant for India in the Herbarium of the Royal Gardens, Kew. Entered the Kew Herbarium in 1863; assistance acknowledged by G. Bentham, F.R.S., in preface to Flora Australiensis, 1863; A.L.S., 1875; Lecturer on Botany at St. Mary's Hospital, 1876; author of numerous papers on Systematic Botany, which, together with his larger works, have given him an authoritative position in this branch of science; author of the Botany (5 vols, 4to) of the "Biologia Centrali-Americana," 1879-88; joint author with Brigade-Surgeon Aitchison, F.R.S., of memoirs on the botanical collections of the several Afghan expeditions (Journ. Linn. Soc., xviii. pp. 29-113, 1880; xix. pp. 148-200, 1883; Trans. Linn. Soc, 2nd Ser. III. pp. 1-139, 1888); engaged by sub-committee of the Government Grant Committee to prepare the "Index Floræ Sinensis," an enumeration of all known Chinese plants (in course of publication, Journ. Linn. Soc., xxiii. 1886-88, *et seq.*).

CHARLES THOMAS HUDSON, M.A.,

LL.D. (Cantab.). President of the Royal Microscopical Society (1888). Was 15th Wrangler, 1852. Joint author of Hudson and Gosse's "Rotifera." Discoverer of *Pedalion mirum*, and of numerous new genera and species of Rotifera, described in papers published in the Journ. Roy. Micros. Soc., *Quart. Journ. Micros. Sci.*, and the *Ann. and Mag. Nat. Hist.* from 1869 to the present year. Specially distinguished for his knowledge of the Rotifera, concerning which he is the chief living authority. ["The genus Pedalion discovered and described by Dr. Hudson is one of the most remarkable and important contributions to animal morphology of the past twenty years."—E. R. L.]

THOMAS MCKENNY HUGHES, M.A.

F.G.S., F.S.A. Professorial Fellow of Clare Coll. Camb. Chev. Ord. SS$^{\text{rum}}$ Maur. et Lazar. Ital. President Brit. Committee, Internat. Geol. Congress. President Chester Nat. Hist. Soc. Hon. Memb. Soc. Géol. de Belg. Memb. Soc. Géol. de France. Memb. Soc. Geol. d'Italia, &c., &c. Woodwardian Professor of Geology, Cambridge. Author of the following papers:—"On the Junction of the Thanet Sand and the Chalk," &c. (Quart. Journ. Geol. Soc. 1866, vol. xxii. p. 402); "Geology of Parts of Westmoreland and Yorkshire" (Proc. Geol. and Pol. Soc. W. Riding, Yorks. 1867); "Break between Upper and Lower Silurian Rocks, Lake District" (*Geol. Mag.* 1867, p. 346); "The Two Plains of Hertfordshire and their Gravels" (Quart. Journ. Geol. Soc. 1868, vol. xxiv. p. 283); "Part of the Geology of the London Basin" (Mem. Geol. Surv. iv. 1872). Memoirs Geol. Surv.—Explanation of Quarter Sheet 98, N.E., and of ditto S.E. (1872). "Man in the Crag" (*Geol. Mag.* 1872, vol. ix. p. 247); "Exploration of Cave Ha, Yorkshire" (Journ. Anthrop. Inst. 1874); "Felstone Implements in Pontnewydd Cave" (*ibid.*); "Classification of the Sedimentary Rocks" (Brit. Assoc. Rept. 1875); "Geological Measures of Time" (Royal Inst. March, 1876); "Silurian Grits, Corwen, N. Wales" (Quart. Journ. Geol. Soc. 1877, vol. xxxiii. p. 207); "Evidence afforded by Gravels and Brick-earth" (as to remains of Man) (Journ. Anthrop. Inst. 1877); "Pre-Cambrian Rocks of Bangor" (Quart. Journ. Geol. Soc. 1878, vol xxxiv. p. 137); "Relation and Duration of Forms of Life on the Earth to the Breaks in the Sedimentary Rocks" (Proc. Camb. Phil. Soc. 1879); "Silurian Rocks of the Vale of Clwyd" (Quart. Journ. Geol. Soc. vol. xxxv. p. 694); "The Pre-Cambrian Rocks of Caernarvon" (*ibid.*, p. 682; "Transport of Fine Mud, &c., by Conferva" (Camb. Phil. Soc., Feb. 1880); "The Altered Rocks of Anglesea" (*ibid.*); "Evidence of Later Movements of Elevation and Depression in British Isles" (Vict. Inst., March, 1880); "On the Geology of Anglesea" (Quart. Journ. Geol. Soc. 1880, vol. xxxvi. p. 237); "Geology of the Vale of Clwyd" (Chester Soc. Nat. Sci., Nov. 1880); Second Paper on "Geology of Anglesea" (Quart. Journ. Geol. Soc., 1882, vol. xxxviii. p. 16); "On the Brecciated Bed in the Dimetian at St. David's" (*Geol. Mag.* 1883, p. 306); "Report of Excursion of the Geol. Assoc. to Bangor, Snowdon, Holyhead, &c." (Proc. Geol. Assoc. vol. viii., July 1883); "Fossils in Pleistocene Gravels, Barnwell, near Cambridge" (*Geol. Mag.*, 1883, p. 454); "Tracts of Terrestrial and Freshwater Animals" (Quart. Journ. Geol. Soc., 1884); "On so-called '*Spongia paradoxica*' from the Red and White Chalk, Hunstanton" (*ibid.*); Report of the Excursion of the Geol. Assoc. to Cambridge (Proc. Geol. Assoc. 1884); "On some Perched Blocks" (Quart. Journ. Geol. Soc., 1886); "On Caves" (Vict. Inst., 1887); "Drifts of the Vale of Clwyd, in relation to the Caves" (Quart. Journ. Geol. Soc., 1887); "Some Brecciated Rocks in the Archæan of Malvern" (*Geol. Mag.* 1887); "On Bursting Rock Surfaces" (*Geol. Mag.*, Nov. 1887).

EDWARD B. POULTON, M.A. (Oxon.),

F.L.S., F.Z.S., F.G.S. Tutor of Keble College. Lecturer in Natural Science, Jesus College, Oxford. Distinguished as a zoologist, and especially for investigations upon the colours of insects. Author of the following, among other papers:—"The Tongue of *Perameles nasuta*" (*Quart. Journ. Micros. Science*, January 1883); "The Tongue of *Ornithorhynchus paradoxus*" (*Quart. Journ. Micros. Science*, July, 1883); "On the Tongues of Marsupialia" (Proc. Zool. Soc., December, 1883). Papers relating to the subject of colour and marking in insects, in

Trans. Entom. Soc., April 1884, August 1885, and June 1886; Proc. Roy. Soc., No. 237, 1885, and No. 243, 1886; "The Experimental Proof of the Protective Value of Colour and Markings in Insects in reference to their Vertebrate Enemies" (Proc. Zool. Soc., 1887); "An Inquiry into the Cause and Extent of a special colour-relation between certain exposed Lepidopterous Pupæ and the surfaces which immediately surround them" (Phil. Trans., 1887); "Notes in 1886 on Lepidopterous Larvæ" (Trans. Entom. Soc., 1887).

William Johnson Sollas, D.Sc. (Cantab.), Hon. LL.D. (Dubl.)

F.R.S.E., F.G.S. Late Fellow of St. John's College, Cambridge. Professor of Geology in the University of Dublin. Author of numerous papers on Geology, Palæontology, and the Natural History of the Sponges, among which the following may be specially enumerated:—"On the Silurian District of Rhymney, &c." (Quart. Journ. Geol. Soc., vol. xxxv. p. 475); "On a New Species of Plesiosaurus, &c." (*ibid.*, vol. xxxvii. p. 440); "On the Structure and Affinities of the Genus *Siphonia* (*ibid.*, vol. xxxiii. p. 242); "On *Stauronema*, a New Genus of Fossil Hexactinellid Sponges" (*Ann. and Mag. Nat. Hist.*, Ser. 4, vol. xix. p. i.); "On the Flint Nodules of the Trimmingham Chalk" (*ibid.*, Ser. 5, vol. vi. p. 384); "On the Sponge Fauna of Norway" (*ibid.*, Ser. 5, vol. v. p. 130, 5 parts).

Charles Todd, M.A. (Camb.), C.M.G.,

F.R.A.S. Postmaster-General, Superintendent of Telegraphs, and Government Astronomer. He has executed important astronomical observations extending over thirty-eight years, including Transit of Venus, Jupiter's Satellites, Determination of Australian Longitudes, &c. He has conducted Meteorological Observations in South Australia extending over thirty years. He has written a Treatise on the Meteorology of South Australia, and other works. He has contributed papers to the Royal Society of South Australia, and was responsible for the erection of the telegraph line across the interior of Australia from Adelaide to Port Darwin, 2000 miles in length, and to Western Australia, 1000 miles in length.

Herbert Tomlinson, B.A. (Oxford),

Formerly Junior Student of Christ Church, Oxford. Whitworth Exhibitioner, 1870. Demonstrator of Natural Philosophy in King's College, London. Author of numerous papers on physical subjects published in the Phil. Trans., Proc. Roy. Soc., *Phil. Mag.*, &c., the most important of which relate to the influence of stress and strain on the Physical Properties of Matter. The following may be enumerated:—(1) "Effect of Magnetization on the Electrical Conductivity of Iron" (Proc. Roy. Soc., 1875); (2) "Increase in Resistance to the passage of an Electrical Current produced in certain wires by Stretching" (*ibid.*, 1877); (3) "Alteration of Thermal Conductivity of Iron and Steel caused by Magnetism" (*ibid.*, 1878). The following papers relate to the influence of Stress and Strain, &c.:—(4) "Moduli of Elasticity" (Phil. Trans., 1883); (5) "Electrical Conductivity" (*ibid.*); (6) "Relations between Moduli of Elasticity, Thermal Capacity, and other Physical Constants" (Proc. Roy. Soc., 1885); (7) "Alteration of the Electrical Conductivity of Cobalt, &c., by Longitudinal Traction" (Proc. Roy. Soc., 1885); (8) "Internal Friction of Metals" (Phil. Trans., 1886); (9) "Co-efficient of Viscosity of Air" (*ibid.*); (10) "On Certain Sources of Error in Connection with Experiments on Torsional Vibrations" (*Phil. Mag.*, 1885); (11) "Temporary and Permanent Effects on some of the Physical Properties of Iron produced by raising the Temperature to 100° C." (*ibid.*, 1886); (12) "Effect of Change of Temperature on the Internal Friction and Torsional Elasticity of Metals" (abstr. in Proc. Roy. Soc., 1886); (13) "Effect on Magnetization on the Elasticity and the Internal Friction of Metals" (Phil. Trans., vol. clxxix. p. 1); and other papers.

Gerald F. Yeo, M.D. (Dubl.),

F.R.C.S. Professor of Physiology, King's College, London. Researches:—"On the Physiology of the Central Nervous System" (with Prof. Ferrier) (Proc. Roy. Soc., 1881; Phil. Trans., 1884); "On the Physiology of Muscle and Nerve" (with Dr. Cash) (Proc. Royal Soc., 1882 and 1883; Journal of Physiol., 1884); (with Mr. Herroun) (*ibid.*, 1884); "On the Composition of Human Bile" (with Mr. Herroun) (Journ. of Physiol., 1884); "On the Cause of the First Sound of the Heart" (with Dr. Barrett) (*ibid.*, 1884). On Pathological Subjects:—"Diseases of the Kidney" (Dubl. Path. Soc., 1865); "Lymph Glands" (*Med. Jährb. d. Aertze*, in Wien, 1871); "Pleuropneumonia in Cattle" (Report for Roy. Agric. Soc., 1878); and of numerous other papers (Proc. Dubl. Path. Soc.; *Irish Hospital Gazette; Dubl. Journ. Med. Sci.*, 1872 to 1875). Author of "Manual of Physiology."

THE SHOOTING-STARS OF APRIL.

IN recent years this meteor group has not developed exceptional activity, nor have its annual returns attracted such general observation as the *Perseids* of August; but it is nevertheless a stream that is entitled to a considerable amount of interest, as some of its displays appear to have been noticed in ancient times, and it is identified with the comet described by Thatcher on April 4, 1861. The modern displays of this shower have not justified the anticipations formed of it in regard to its richness because of its periodic character. Of late years the special region of the orbit where the meteorites are clustered in the richest profusion has probably been far removed from the earth. The apparent feebleness of the shower may therefore be regarded as merely temporary. The *Leonids* of November have during the last fifteen years similarly offered a poor spectacle to those who have encouraged the hope that they might attain a prominent degree of activity. But with the parent comet (I. 1866), in distant parts of its path, it is not surprising that comparatively very few of these meteors have been seen. The same remark equally applies to the April meteors. They are chiefly condensed near the comet of 1861, which is now traversing a section of its orbit sufficiently remote from the earth to have withdrawn all the richer parts of the stream from our cognizance. The meteorites lately encountered by the earth upon crossing the node of this comet on about April 20 are simply the outlying and more scattered remnants of the system. It is highly probable, however, that the distribution of the particles is to some extent irregular, and that in certain years the shower attains a more pronounced aspect than the conditions would indicate. Thus in 1884 there was a rather conspicuous display, the number of meteors visible being about 22 per hour for one observer; but this, though representing a striking degree of productiveness relatively to the minor showers, yet falls much below the character of a meteor-stream of first-class importance.

In the present year, the Lyrid showers, if visible, will be most favourably witnessed in the early part of the night, as moonlight will interfere in the morning hours. On April 19 the moon rises at 11h. 53m., on the 20th at 13h., and on the 21st at 13h. 55m. The north-eastern sky should be watched before our satellite emerges from the horizon. The most essential features to be noticed during the progress of the display will be the following:—

(1) The position of the radiant-point on each night of observation. It is very important to note whether this point becomes rapidly displaced to the eastwards, as in 1885 (NATURE, vol. xxxii. p. 5).

(2) The horary number of meteors appearing to one observer, and the proportion radiating from Lyra.

(3) The paths and visible peculiarities of the largest meteors. It is necessary that such data be gathered and utilized in computations of the real paths of those meteors which may be recorded at more than one station.

(4) The duration of the individual meteor-flights. This is an element extremely difficult to estimate with tolerable precision, especially in respect of swift-moving meteors like the Lyrids.

(5) The positions of radiants of the minor streams which furnish meteors at this epoch. Subjoined are the